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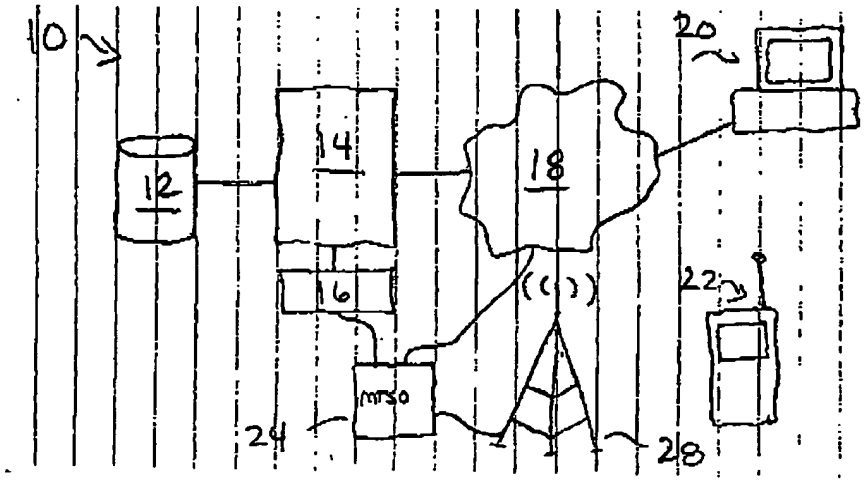

(57) Abstract

The systems and methods allow a wireless device user to receive phone numbers representative of businesses, persons and places from which the user can purchase goods and services. As described herein these systems allow a wireless device user, typically a wireless device user entering a geographic region that is less familiar to that user, to call into a central number where the user can employ the wireless device to request information including the phone numbers of local merchants, taxi services, restaurants, hotels, airlines, and other such information to be downloaded to the programmable memory of the wireless device and programmed into the wireless device. Typically, as described herein the phone numbers are programmed into the wireless device programmable memory as speed dial numbers that the user can access for contacting providers of the desired goods and services.

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SYSTEMS AND METHODS FOR ADVERTISING THROUGH A WIRELESS DEVICE

REFERENCE TO RELATED APPLICATIONS

This application claims priority to USSN 60/ 133, 189 filed 7 MAY 1999, entitled APPARATUS AND PROCESS FOR INTERACTION AND CONTACT BETWEEN BUSINESS AND CLIENT, and naming STEFAAN DE SCHRIJVER as inventor.

Field of the Invention

The invention relates to systems and methods for allowing business and other entities to deliver advertising to a customer employing a wireless hand held device.

Background of the Invention

Today there are applications in place that allow wireless device users to access data stored through the Internet. Specifically, the wireless application protocol is a protocol, or a set of rules, that allows a wireless device to access the Internet, including the World Wide Web. In many ways WAP is equivalent to TCP/IP, the Internet suite of protocols that allows a computer or server to access the Internet. WAP was set in motion by Motorola, Nokia, Erikson and other back in 1997 with the founding of the WAP forum. Since the establishment of that forum, browsers have been developed that may operate on wireless devices, such as wireless handset phones, which allow wireless users to access appropriately formatted data on the Internet.

The popularity of services that allows wireless devices to access Internet data continues to grow. In part it is this growing popularity that has motivated wireless network providers to increase bandwidth at which data may be exchanged between a wireless network

and a wireless device. In fact today, GSM is close to 16k bps. Accordingly, meaningful data transmissions between a wireless device and a server on the Internet is becoming a reality.

With the improved underlying platform for supporting wireless data transfers of Internet data, many existing web services are now become web enabled. Specifically, existing web services such as Yahoo or the Dow Jones Online, are now providing information such as stock prices, and services, such as search engine capabilities, in a format that may be readily accessed and employed by a wireless device. Accordingly, today there is a significant effort underway to rewrite and modify existing web services to provide hand-held wireless device users with access to information and services provided by the Internet.

Additionally, new services are being developed on the Internet that are primarily tailored to servicing wireless device users. For example, today's systems are being developed that will allows a wireless handset user to access calendar data, contact lists, and other types of data commonly associated with a personal digital assistant. Accordingly, a wireless device user may employ their wireless device, such as a cell phone, to access a web service that can provide all the information and services commonly provided by a PDA such as the Palm Pilot. In this way the wireless device user may employ their handset both as a voice communication device and as a computing platform, such as a PDA.

However, although existing Internet services are now being rewritten and modified to allow access through wireless devices, and although new services and applications are being developed that use server side processing to extend the use of a wireless device, there is still a need for systems that will allow users to leverage the Internet infrastructure to more efficiently use their wireless device. For example, there is a need for services that are deployed over the Internet and accessible through a wireless device which will allow a user to more effectively use the traditional modes of operation of a hand-set device. For example, a wireless device use that roams into a remote location, is largely dependent upon the local telephone information service to get phone number for people and companies that the user wishes to contact within that remote location. Although the wireless infrastructure provides excellent information directory services, such systems are not well prepared to leverage the

PAGE 11/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

strength of the Internet and to provide more efficiently information that is likely to be of use to the roaming wireless device user.

Accordingly, there is a need in the art for systems and services that will support a wireless device user to aid the user in more efficiently employing their wireless device.

Summary of the Invention

More particularly, the systems and methods described herein allow for advertising over a wireless network. Such systems may comprise a wireless device that has a programmable memory for storing telephone numbers, and a web site portal that will have a database storing a plurality of data records. Each data record may have storage for a telephone number and each data record may be associated with a category of goods or services. The web site portal may also have an interface for allowing a company, or any provider of a good or service, to select one of the categories of goods or services and to upload to the data record associated with the selected category a phone number and a data message for storage in the associated data record. Additionally, the systems may include a computer process for allowing the programmable wireless device to request data from the website portal and, in response to the request, select at least one of the categories of goods or services. The computer process may also program a phone number into the programmable memory of the wireless device, typically as a speed dial number, for allowing a wireless device to contact the provider of the selected good or service.

The systems and methods described herein may also include mechanisms that allow for delivery to the wireless device a program for programming the phone number into the programmable memory. The number programmed into the programmable memory may be representative of the phone number provided by the company or other provider or good or service, or may optionally be a phone number associated with a central telephone server that may process information provided by the wireless device to determine a phone number to which the wireless user may be forwarded and which will connect the wireless device user to the provider of the good or service.

PAGE 12/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

In one particular embodiment, the systems and methods described herein include a web site portal that allows a company to upload to the web site portal server a banner add that can be associated with a phone number for that provider of goods and services. The banner add can be a conventional banner add and the web site portal server may include a resizing process that will process the banner ad to resize the add for presentation on a wireless device.

In a further embodiment the systems described herein include mechanisms for collecting location information that may be associated with the wireless device and for processing the location information for selecting a phone number. For example, in one practice the web site portal may be provided with a signal representative of the geographic location of a cellular tower supporting the transmission of data to the wireless network. The server may process this information to determine the geographic location of the wireless device and may select phone numbers that are relevant to that location. In one embodiment this geographic information is employed for selecting between a plurality of different phone numbers wherein a phone number relevant to the determined geographic location of the wireless device is provided to the wireless device.

In a further practice, the wireless device may include a virtual machine that may be programmed for storing information within the speed dial memory of the wireless device. In one embodiment the virtual machine runs WML scripts or WML compatible scripts. Optionally, the scripts may include a security mechanism that requires the users authorization before programming the wireless device number into the programmable memory. The security mechanism may include a password verification mechanism, a biometric passkey mechanism or any other suitable mechanism for verifying the identity, and/or authority of the user authorizing that the programmable memory of the wireless device be accessed by the script, or by the web site portal.

In a further embodiment, the advertising information and phone number provided by a provider of a good or service may be part of a package of such numbers and ads that may be presented as a group to the user. These groups of ads may be centered around themes such as

PAGE 13/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

tourism, business travel, and other such themes. Accordingly a wireless device user entering a remote geographical location about which the user has little information, may access the web site portal to have delivered to the wireless device information and phone numbers for local taxi services, airlines, hotels, and other such goods and services.

Other objects of the invention will, in part, be obvious, and, in part, be shown from the following description of the systems and methods shown herein.

Brief Description of the Drawings

The foregoing and other objects and advantages of the invention will be appreciated more fully from the following further description thereof, with reference to the accompanying drawings wherein;

Figure 1 depicts one system according to the invention;

Figure 2 depicts in more detail a web server system that may deliver web pages and scripts that may be process by a wireless device;

Figure 3 depicts a flow chart diagram of how a company accesses the web site portal and uploads information to that portal;

Figure 4 depicts a flow chart representation of one process for a web server to create a local advertising package; and

Figure 5 presents a flow chart diagram of one process wherein a wireless device user calls in and receives information from a portal.

PAGE 14/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

Description of the Illustrated Embodiments

To provide an overall understanding of the invention, certain illustrative embodiments will now be described, including a system that allows for local advertising over a wireless telephone device. However, it will be understood by one of ordinary skill in the art that the systems and methods described herein can be adapted and modified for other suitable applications and that such other additions and modifications will not depart from the scope hereof.

The systems and methods described herein include systems that allow for local advertising through wireless communication devices, such as cellular phones equipped for communicating via the wireless application protocol (WAP). For example, the systems described herein include systems wherein a user having a wireless device that can exchange data via the WAP and that includes a programmable memory that may be employed for storing telephone numbers including portions of a programmable memory that can store telephone numbers which may be speed dialed by manipulating the keypad of the wireless device. As described in certain illustrated embodiments herein, a user having such a wireless device may roam into a geographic location, such as another part of the country, that the user is unfamiliar with. Employing the systems described herein, local merchants may access a WAP portal and upload to that portal banner ads and phone number associated with those merchants. Each of the banner ads and phone number may be associated with a category of products or services that are provided by respective ones of the merchants. The WAP portal may be a conventional web site that allows merchants to upload the information via a HTML form. The portal server may process the information collected through the form and create a data record that may be stored in a database optionally maintained by the portal. An ad server may also be present at the portal to respond to requests from wireless device users to download information about regional services available to the user. To this end the web portal may allows wireless devices to call in to the portal, wherein the call will be processed by the portal to determine the geographic location of the wireless device and any interests such as tourism or business travel offered by the user of the wireless device. The ad server may select one or more ads and associated phone numbers for delivery to the wireless device.

PAGE 15/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

Optionally, the web server may deliver the ads and telephone numbers to the wireless device and may further deliver an executable script that can program the speed dial memory of the wireless device. Accordingly, after having called into the portal, the wireless device user can receive from the portal a plurality of telephone numbers each associated with the region from which the user made the call and each representative of goods or services, such as taxis, airlines, hotels, and other such information that is of interest to the user.

This invention relates to a system that would allow a programmable memory in a device, such as for example a cellular phone, a smartcard, a smartpen, a conventional computer keyboard, or any suitable system that has a programmable memory to be accessed and programmed by vendors that are interested in inserting into slots within the memory advertising information such as advertising banners. In one embodiment, the system would provide for cellular phone systems wherein advertisers can pay to insert into the programmable memory of the cellular phone advertising banners, telephone numbers, or other such information useful to the company such that a user is provided with a programmed memory that includes advertising information. For example, a cellular phone can be programmed with a set of speed dial codes wherein the speed dial codes have been provided, and paid for by a company. For example, the Hertz Company can pay for downloading a speed dial number for the local Hertz Rent-A-Car Agency. Therefore, when the phone user wishes to access a rental car, the user merely needs to depress the buttons to access the programmable speed dial codes within his phone to automatically call a rental car company. In this case, as Hertz has paid for the right to insert their data into the programmable memory, the phone would dial the number provided by Hertz. Optionally, the screen of the cellular phone could display a banner indicating that the phone is dialing the Hertz Rent-A-Car Agency.

In one embodiment, a user can dial a phone number and optionally address series of digits identifying the user's preferences or other information and then can hang up. A server can call back to the phone company and download to the phone company information necessary for changing the programmable memory of the system as desired by advertisers who have purchased memory space within the user's phone. Optionally, the system can be

made secure by having someone enter passwords, biometric data, or electronic signatures.

In a further embodiment, the phone is equipped with IRDA, or blue tooth input path that can be accessed by, for example, a computer system for programming the memory of the cellular phone as desired by advertisers.

In a further aspect, it will be understood that the invention includes both business methods for providing franchises for subscribing local advertisers, such as for a certain area code, and providing a server site that can download the information to users that subscribe to the service. Similarly, the system can be understood as server systems that provide for downloading such information to a user's programmable memory device, such as their PDA or cellular phone.

More specifically, Figure 1 depicts one system 10 that allows a wireless device user to access a platform that can deliver into the programmable memory of the wireless device a set of telephone numbers that the user may employ for accessing goods and services from local merchants. More specifically, Figure 1 depicts a system 10 wherein a database 12 couples to a server 14. The server 14 couples to a branch exchange 16 and to the Internet 18. The branch exchange 16 couples to a cellular switch 24 and to a broadcast unit 28. The broadcast unit 28 may exchange data with the wireless device 22 and the Internet 18 may exchange data with the client system 20.

Generally, the server 14 may be a WAP compatible web site that allows local merchants, or other providers of goods and services to employ the client 20 to access the server 14 through the Internet 18. The server 14 may include a web server, such as the Apache web server, that will monitor requests coming in from the Internet 18 and direct it to the IP address of the server 14. Accordingly, a request by a user through client 20 may be detected by the server 14 and a web page may be delivered by the server 14 to the client 20 via the Internet. The web page delivered to the client 20 may include an HTML form that provides data entry fields that a merchant may complete to upload data to the server 14. Accordingly, Figure 1 depicts that the server 14 and the client 20 may communicate via the

PAGE 17/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

Internet 18 according to conventional techniques for exchanging information between a client system such as the client 20 and a server, such as the depicted server 14.

Figure 1 further depicts that the server 14 may also communicate via the Internet 18 to the cellular switch 24 and the broadcast system 28. Accordingly, the server 14 may employ the Internet 18 and the cellular or wireless infrastructure depicted by the switch 24 and station 28 to transmit data according to the Internet protocol to the wireless device client 22. The wireless device client 22 may be in one embodiment a wireless telephone, such as a GSM phone, that includes a programmable memory and a browser application, such as the UP.Browser available from Phone.com. Accordingly, the server 14 and the wireless communication device 22 may communicate via the Internet 18 to exchange information between the server and the wireless device 22.

Additionally, Figure 1 also shows that the server 14 further connects to an optional branch exchange 16. The branch exchange 16 may be a conventional switch system for coupling the server 14 to the public switching telephone network (PSTN). Such exchanges are available from Lucent technologies and Nortel Networks. As further depicted in Figure 1 the branch exchange 16 couples via a communication path, such as the telephone lines of the PSTN, to the cellular switch 24. The cellular switch 24 connects to the broadcast system 28 for communicating with the wireless device 22. Accordingly, Figure 1 further depicts that the server 14 and the wireless device 22 may exchange information via the cellular network and the PSTN.

Turning now the elements that compose the system 10 depicted in Fig 1, it can be seen the system 10 includes a network based system that includes a plurality of client systems 20 and 22 that connect through a network 18, such as the Internet IP network, or any suitable network to a server system, such as the server system 14 depicted in Figure 1. The server 14 may connect over dedicated channels, over the Internet, or by other means, to the client systems 20 and 22. Preferably the servers selected for its proximity to a major Internet node, such as the MAE-EAST Internet exchange.

PAGE 18/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

For the depicted system 10, the client systems 20 and 22 may be any suitable computer system such as a PC workstation, a handheld computing device, a wireless communication device, such as a cellular phone having a programmable memory, or any other such device, equipped with a network client capable of accessing a network server and interacting with the server to exchange information with the server. In one embodiment, the network client is a web client, such as a web browser that may include the Netscape web browser, the Microsoft Internet explorer web browser, the mini-browser from phone.com, the Lynx web browser, or a proprietary web browser, or web client that allows the user to exchange data with a web server, and ftp server, a gopher server, or some other type of network server.

Optionally, the client and the server rely on an unsecured communication path, such as the Internet, for accessing services on the remote server. To add security to such a communication path, the client and the server may employ a security system, such as any of the conventional security systems that have been developed to provide to the remote user a secured channel for transmitting data over the Internet. One such system is the Netscape secured socket layer (SSL) security mechanism that provides to a remote user a trusted path between a conventional web browser program and a web server. Therefore, optionally and preferably, the client systems 20 and 22 and the server system 14 have built in 128 bit or 40 bit SSL capability and may establish an SSL communication channel between the clients and the server 14. Additionally, a specification called WTLS also implements options for authentication and encryption and is adapted for use in the mobile environment. Other security systems may be employed, such as those described in Bruce Schneir, *Applied Crytpography* (Addison-Wesley 1996). Alternatively, the systems may employ, at least in part, secure communication paths for transferring information between the server and the client. For purpose of illustration however, the systems described herein, including the system 10 depicted in Fig. 1 will be understood to employ a public channel, such as an Internet connection through an ISP or any suitable connection, to connect the subscriber systems 20 and 22 and the server 14.

PAGE 19/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

The server 14 may be supported by a commercially available server platform such as a Sun Sparc ™ system running a version of the Unix operating system and running a server capable of connecting with, or exchanging data with, one of the subscriber systems 20 and 22. In the embodiment of Fig. 1, the server 14 includes a web server, such as the Apache web server or any suitable web server. The web server component of the server 14 acts to listen for requests from subscriber systems 20 and 22, and in response to such a request, resolves the request to identify a filename, script, dynamically generated data that may be associated with that request and to return the identified data to the requesting subscriber system. The operation of the web server component of server 14 may be understood more fully from *Laurie et al.*, Apache The Definitive Guide, O'Reilly Press (1997); and Jamsa, *Internet Programming*, Jamsa Press (1995), the teachings of which are herein incorporated by reference. The server 14 may also include components that extend its operation to accomplish the integrated financial transactions described herein, and the architecture of the server 14 may vary according to the application. For example, the web server may have built in extensions, typically referred to as modules, to allow the server 14 to perform operations that facilitate the data transfer transactions desired by a subscriber, or the web server may have access to a directory of executable files, each of which files may be employed for performing the operations, or parts of the operations, that implement the integrated financial transactions of the subscriber.

The server 14 may couple to a database 12 that stores information representative of data records for delivery to a client system. The data records may include storage for the telephone number, ad banner, url, directions, and other information uploaded by the local merchant. The depicted database 12 may comprise any suitable database system, including the commercially available Microsoft Access database, and may be a local or distributed database system. The design and development of database systems suitable for use with the system 10, follow from principles known in the art, including those described in McGovern et al., *A Guide To Sybase and SQL Server*, Addison-Wesley (1993); and Yarger et al. *MySQL & mSQL* O'Reilly (1999). The database 12 may be supported by any suitable persistent data memory, such as a hard disk drive, RAID system, tape drive system, floppy diskette, or any other suitable system. The system 10 depicted in Figure 1 includes a database device 12 that

PAGE 20/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

is separate from the server station platform 14, however, it will be understood by those of ordinary skill in the art that in other embodiments the database device 16 may be integrated into the server 14. Additionally, as the systems and methods described herein allow for franchises to be established that allow for supporting the advertising activities of local merchants, it will be understood that a plurality of systems, such as the depicted system 10 may be provided over the Internet infrastructure, and such system may optionally comprise a distributed database.

Figure 2 depicts in greater detail the server system 14 depicted in Figure 1. Specifically, Figure 2 depicts that the server 14 may include a web server 38, scripts 42 and 44, web documents, such as WML documents 48 and client scripts 50 such as WML scripts.

Generally Figure 2 depicts that the server 14 includes a web server 38, that may access a directory or library of executable code. The executable code, such as the depicted scripts 42 and 44, may be employed by the server 14 for implementing the transactions of the system 10 that allow local merchants to upload advertising information into the database 12 so that data records get created and stored within the database 12. These data records may include the phone number of the local merchants, a URL to a website associated with the merchant, and other data such as directions to the merchants place of business, the phone number for the merchant, and other such information. One example of a data record is presented below.

DATA RECORD
Banner ad
Telephone Number
Description for Number
Note

Additionally, the scripts 42 may store with the server 12 an executable script, such as a WML script that may execute on a virtual machine that may optionally be present on the

PAGE 21/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

wireless device 22. As will be described hereinafter the scripts may be employed for executing telephony applications on the wireless device 22.

In one embodiment, the server 38 is configured for operating according to the WAP. To this end, the server 38 may be configured to serve static WML or HDML. The modifications for adjusting the operation of the web server to server WAP compliant applications are well known in the art, and include adding the an entry to the web server's MIME configuration table that includes:

File Extension	MIME Type
.wml	text/vnd.wap.wml
.wmls	text/vnd.wap.wmlscript
.hdml	text/x-hdml
.bmp	image/bmp

Additionally, for Dynamic content, the web server 38 may be configured as is known in the art to output the appropriate Content-type HTTP response header string, and the method for implementing this will vary depending on the computing environment. Conventional programming languages (e.g. Perl) direct that you print the actual Content-type header string at the beginning of the output, while scripting environments (e.g. Cold Fusion) usually provide tags to control this at a higher level. One examples includes:

- Perl: Print the HTTP response header string, followed by a blank line before printing a WML deck:

```
print "Content-type: text/vnd.wap.wml\n\n";
print $DECK;
```

Additionally, in an optional embodiment, the server 38 employs WAP v1.1 which is understood to include an optional specification known as WTA (Wireless Telephony Applications). This is understood to allow incoming and outgoing calls to be handled within WML and WMLScript, permitting trusted parties such as network operators to deploy combined voice call and Internet services in an easily programmable way, in conjunction with

PAGE 22/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

a network WTA server. Example uses are automatically calling a number found in a yellow pages search, and visual interfaces to voicemail systems. For the systems and methods at hand, this allows scripts, such as the script 50 to be downloaded to the wireless device for programming the device memory with content, including telephone numbers, delivered from the server 14. Accordingly, for wireless devices that include a virtual machine, similar to the Java virtual machine, the systems described herein may deliver content that can be executed within the virtual machine.

The design and development of such systems follow from principles known in the art including those described in the software development kit provided by Phone.com of Redwood City CA, that enables Web developers to create HDML and WML information services and applications. The SDK includes a simulator that simulates the behavior of an UP.Browser-enabled device. The simulator can run applications in local mode or connect to an UP.Link to test the UP.Link-enabled services and API's. Phone.com also provides a UP.Link for developers to use so that they can create applications without the need for a handset or expensive carrier infrastructure. The simulator runs on either Windows '95 or Windows NT. Also included is a set of UP.Link developer documentation; sample files and example source code; and libraries of Perl, C and COM Object functions, which describe the process of generating WML or HDML and handling HTTP requests.

Additionally, the scripts 42 and 44 as well as other scripts that may be present on the server 14 may also be employed for allowing the wireless device 22 to access the server 14 through the web server interface 38 or optionally through the branch exchange 16 and to request information, such as the phone numbers of local service and good providers. To this end the scripts may execute on the server platform 14 to collect information from the database 12 and to format that information into a format suitable for delivery to the particular type of wireless device 22 that requested the information. The information may then be downloaded to the wireless client 22 either through the Internet interface or through the PSTN via the branch exchange 16. In either practice, the wireless device 22 may be programmed to include the information requested by the wireless device.

PAGE 23/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

Optionally, additional scripts may be provided which would allow a wireless device user to user a traditional desktop client such as the depicted desktop client 20. By using the desktop client 20 the wireless device user may use the more efficient data entry devices of the client 20, such as the superior keyboard and mouse that are typically part of a desktop system to select different content that may be uploaded by the user to the database 12 and later retrieved by the user through their wireless device 22 wherein they access the portal supported by the server 14 to collect from the portal those phone number, ads, and other information that they had earlier selected while operating the desktop client 20.

As can be seen from Fig. 2, the server 14 acts as middleware that coordinates the operations of the merchant as it uploads information into the database 12 and the operations of the client as it retrieves information from the database 12. Specifically, the server 14 is as a functional block diagram that includes a web server 40, a directory of web pages 48, scripts 50 for execution on the client 22 and scripts 42, and 44 for executing on the server. The web server 40 can be any suitable web server, as discussed above, and in this example, can be understood as the Apache web server listening to port 80 and having access to a set of executable files stored in a directory accessible to the web server 40 such as the cgi-bin directory. One such executable file may be a script that implements a the data record creation process for creating a data record for the merchant and for storing the data record in the database 12. The operation of one such script is depicted in Fig. 4. Another script may be invoked in response to a request from a client to access data, such as a set of phone numbers for a business traveler entering a certain location. The operation of such a script is depicted in Figure 5. Additional scripts, or other types of executable files may also be provided to implement a conventional, but optional, ad serving process that processes characteristics of a client request, such as the type of wireless device, any profile information provided, time of day, time of year, location and other such information to select an ad and telephone number, or a set of ads and telephone numbers, to deliver to the wireless device.

The scripts may be Perl V scripts, C language programs or any other suitable programs. The design and development of the such scripts follows from principles known in the art of computer programming, including those set forth in Wall *et al.*, *Programming Perl*,

PAGE 24/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

O'Reilly & Associates (1996); and Johnson *et al, Linux Application Development*, Addison-Wesley (1998). Additionally, in other embodiments, these processes may be implemented, at least in part, by employing the operating system to restrict the execution of certain scripts and to restrict access to certain files by configuring the operating system in a selected manner. Techniques for so configuring the operating system are known in the art, including those techniques set forth in Bach, *The Design of the Unix Operating System*, Prentice-Hall (1986).

Figure 3 depicts one process 60 for how a local merchant may employ the client system 20 to log on to the server 14, select a category for their goods and services and upload data and a phone number to be associated with that category for later deliver to a wireless device user.

Specifically Figure 3 depicts a process 60 that beings with step 62. In step 62 the local merchant uses a client to log into the server 14. Once logged in the process 60 proceeds to step 64 wherein the server 14 presents to the client 20 a web page that present different categories from which the local merchant may select. Such categories may include taxi services, airlines, hotels, florists, and other such information. Once the local merchant has selected a category, the process proceeds to step 68 wherein the form is completed including all information necessary for providing a phone number and identification information for that merchant. The form is submitted in step 68 and the form is transferred to the server 14. At server 14 the process 16 determines whether or not a record has already been created for the particular category of interest to the local merchant. If a record has not been created then the process 70 proceeds to step 72 wherein a record is created. A data record created may include information that is representative of the phone number provided by the local merchant, an identification for the phone number which may be shown in association with the phone number on the user display of the device 22 when the speed dial numbers are presented to the user, URL's of websites associated with the merchant, and any other information.

The process 60 may then proceed from step 72 to step 74 wherein a priority is created for the particular record. For example, in one embodiment the server 14 includes an ad server that present phone number and information for local merchants to wireless users that have requested service based in part on the fee paid by the local merchant to have their Returning

PAGE 25/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

back to step 70 if a record has already been created for the category of interest, the process 70 proceeds to step 78 wherein a priority is determined for the information downloaded to the wireless users. Once the ad priority is set in step 74 the process 60 proceeds to step 80. As described above, in those applications wherein ad server is provided by the server 14, a priority for downloading an ad to a web device 22 may turn on factors such as the price paid by the local merchant for that ad. After step 78 the system proceeds to step 80 wherein the ad is provided to the ad server so that an ad server may present the add to a wireless device user. Once provided the process 60 terminates at step 82.

Turning now to Figure 4, one process is depicted for allowing a web server to create a local advertising package.

Specifically, Figure 4 depicts a process 90 wherein the server 14 detects a request from client. The request may be an HTTP request from the client wireless device such as the device 22, or maybe a request coming into the server 14 from the public switching telephone system. Upon receipt of the request, the process 90 proceeds to step 94 wherein the request is examined to determine the geographic area of the wireless device 22. In one embodiment, the request includes a standard HTTP header that may include geographic location information within the header. For example, in certain embodiments of the invention the cellular network, such as the cellular switch within the network may process HTTP requests from a wireless device to a web portal and include within the HTTP header information that is representative of the local area code for the cellular antenna servicing the wireless device. Alternatively, in other embodiments the user may be required to enter location information at the time of accessing the portal. In one embodiment, the server 14 provides to the wireless device 22 a series of maps that the user may manipulate to graphically select different portions of the map until that section of the map where the user is located is identified. Once this information is collected it may be forwarded to the web server for use by that server in selecting local advertisements, or any advertisements for the user.

Upon determining the area, the process 90 may proceed step 98 wherein the request is further processed to determine the type of phone, or other wireless device being employed by

PAGE 26/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

the user. For example, the type of phone may be inserted by the wireless device when transmitting the HTTP header, or any other header being employed for carrying data from the wireless device to the server system. The phone type information may be employed by the server 14 for selecting the programming method for programming numbers into the speed dial memory of the wireless device. Optionally, the phone type may also be processed to determine whether the server 14 may correspond with the wireless device, or whether the server 14 may program the memory of the wireless device. The information representative of the phone type may also be employed by the server to determine whether or not graphical icons representative of banner ads stored by a local merchant in association with a phone number may be delivered to the wireless device for display on the screen of the wireless device. It will be apparent to those of ordinary skill in the art that other types of decisions may be made based on the type of wireless device that is communicating with the server systems described herein.

Once the phone type is determined the process 90 may proceed to step 100 wherein the server 14 determined whether a user profile is available for that user. In certain embodiments, the systems described herein employ profiling cookies, such as those provided by the Engage Corporation of Andover, Massachusetts, for collecting information about the interests of the user. Optionally in such an embodiment the systems described herein may employ the HTTP protocol for exchanging cookies between the client and the server.

Once information about the wireless device platform and the user is obtained, the process 90 may employ an ad server, similar to the ad servers provided by the Adknowledge Corporation of California, USA, that may process characteristics of a user and their platform to determine a set of advertisements to present to that user. For example in Figure 4, the process 90 includes a step 102 wherein the ad server selects ads as a function of the request made by the user, the area, and the user profile. Accordingly, if the user makes a request to receive an ad package associated with a tourist ad package, the ad server may select tourist ads suitable for delivery to a user with the designated profile and in the designated geographic area.

PAGE 27/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

Optionally, the ad server process may include a process for monitoring whether a client calls to a local merchant, and may maintain an accounting of the number of call throughs that each merchant gets. The server 38 may adjust the advertising rates, or the fee for supporting advertising based on these call throughs. In one practice, the server 38 provides for a local merchant that has purchased ad space, a connection phone number that will be programmed into the client in association with the ad provided by the merchant. When the client dials that number the client may be connected back to the the branch 16, or any other branch that can track calls to merchants, and by employing the DNIS and caller ID, the server 38 can determine that a user called for a local merchant. The server 38 can then use the switch 16 to forward the user to the local merchant and can make an accounting of the fact that the merchant called.

In a further optional practice, the server 38 can provide to the wireless client one phone number to be called anytime the user wants to connect to any of the merchants downloaded by the server 38. In this practice, the number provided by the server connects the client 22 to the branch 16. In the same operation, the a script on the client 22 can transmit via the Internet 18, data indicating that the user is calling in to the server 38 for a particular local merchant. The server 38 can use the information provided over the Internet connection to connect the client to the proper merchant, and can, after the connection is made, or at another appropriate time, account for the call to the merchant by adjusting rates for advertising.

Proceeding to step 104 the process 90 may then select the delivery method for delivering information to the wireless device and select the programming method for programming information into the programmable memory of the wireless device. For example, in one practice the server 14 determines that the appropriate delivery message is to employ the HTTP protocol to deliver data and programming instructions, such as a WML script, through the Internet to the wireless device. Alternatively, the server may determine that an appropriate delivery method is to deliver programming information through the PSTN. Alternatively, combinations of both delivery methods may be employed. These two methods are graphically depicted in Figure 2 which shows that the wireless device 22 can

PAGE 28/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

receive information, including content and programming instructions from either the LEC or the Internet 18. In one practice, the server 38 processes the request from the client to determine the type of client. The server 38 then selects the appropriate programming process for that device type. For example, the server 38 could transmit data and the script over the Internet, wherein the script will program the data memory of the wireless device. Alternatively, the server 38 could determine that the user needs to call back to a number supported by the branch 16, and can employ a series of tones, including DMTF tones, to program the phone's memory.

Additionally in step 104 the process 90 may determine the best process for programming information into the programmable device. For example, in one embodiment a WML script is employed for running on a virtual machine supported by the wireless device. Employing a telephony application interface the wireless device may execute the script to have programmed into the devices memory the phone numbers being delivered from the server 14.

After step 104 the process may proceed to step 108 wherein the server delivers the local ad package to the cellular device wherein the local ad package may include content such as ad banners, name fields, phone numbers and scripts for programming and other applications.

Turning now to Figure 5 there is depicted a flow chart diagram representative of one process for allowing a user and a wireless device to call into a portal to have telephone numbers programmed into the programmable memory of the wireless cellular device.

Specifically Figure 5 depicts a process 120 wherein a wireless device user calls into a portal such as the WAP portal 14 depicted in Figure 1. In step 24 the user completes a form such as an HTML form, or WML form that has been presented by the server 14 to the wireless client. Upon completion of the form the user may submit the form for delivery through the Internet to the server. Proceeding to step 128, the process 120 will allow the user of the wireless device to authorize the programming of any information into the

PAGE 29/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

programmable memory of the device. For example, the server may deliver a set of phone numbers and an executable script to the wireless device for programming the memory of the wireless device. Optionally, the client device may include a browser that requires the user to authorize, or verify their identity, before the programming may take place. In one practice, the process 120 may require in step 128 that the user enter a password known by the wireless device for allowing the system to be programmed. Alternatively, the wireless device may include a browser that requires a biometric authorization such as signature by a smartpen, such as the type described by LCI Technologies Company of the Netherlands. In either case once authorized, the programming may take place and the process 120 proceeds to step 130 wherein a user may view the new phone numbers programmed into their memory as well as advertisements associated with those new phone numbers.

Although Fig. 2 graphically depicts the server 14 as functional block elements, it will be apparent to one of ordinary skill in the art that these elements can be realized as computer programs or portions of computer programs that are capable of running on the data processor platform 12 to thereby configure the data processor 12 as a system according to the invention.

Additionally, as discussed above, the local advertising systems can be realized as a software components operating on a conventional data processing system such as a Unix workstation. In that embodiment, the local advertising mechanisms may be implemented as a C language computer program, or a computer program written in any high level language including C++, Fortran, Java or basic. Additionally, in an embodiment where microcontrollers or DSPs are employed such as if the systems are deployed as part of a cellular switch, the systems can be realized as a computer program written in microcode or written in a high level language and compiled down to microcode that can be executed on the platform employed. The development of such systems is known to those of skill in the art, and such techniques are set forth in Digital Signal Processing Applications with the TMS320 Family, Volumes I, II, and III, Texas Instruments (1990). Additionally, general techniques for high level programming are known, and set forth in, for example, Stephen

PAGE 30/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

G. Kochan, *Programming in C*, Hayden Publishing (1983); and See *The C++ Programming Language*, 2nd Ed., Stroustrup Addision-Wesley. It is noted that DSPs are particularly suited for implementing signal processing functions, including preprocessing functions such as image enhancement through adjustments in contrast, edge definition and brightness. Developing code for the DSP and microcontroller systems follows from principles well known in the art.

Those skilled in the art will know or be able to ascertain using no more than routine experimentation, many equivalents to the embodiments and practices described herein. Additionally, additions may be made without departing from the scope of the invention. Accordingly, it will be understood that the invention is not to be limited to the embodiments disclosed herein, but is to be understood from the following claims, which are to be interpreted as broadly as allowed under the law.

PAGE 31/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

I claim:

1. A system for allowing advertising over a wireless network, comprising

a wireless device having a programmable memory for storing telephone numbers,

a web site portal having a database for storing a plurality of data records each data record having storage for a telephone number and each data record being associated with a category of goods or services and having an interface for allowing a company to select one of the categories of good or service and to upload to the data record associated with the selected category a phone number and a data message for storage in the associated data record, and

a computer process for allowing the programmable wireless device to request data from the web site portal and, in response to the request, selecting at least one of the categories of goods or services, and programming a phone number into the programmable memory of the wireless device for allowing the wireless device to call for the selected category of goods or services.

2. The system of claim 1, further including means for delivering to the wireless device a program for programming the number into the programmable memory.

3. The system of claim 1, wherein the computer process includes means for programming the phone number associated with the ad into the programmable memory.

4. The system of claim 1, wherein the computer process includes means for programming a phone number associated with a central telephony server into the programmable memory.

PAGE 32/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

5. The system of claim 1, wherein the web site portal includes a server for allowing the company to upload a banner ad for being stored in association with the phone number.

6. The system of claim 5, further comprising a resizing process for processing the banner ad to resize the ad for presentation on the wireless device.

7. The system of claim 1, further including means for collecting location information associated with the wireless device and for processing the location information for selecting a phone number.

8. The system of claim 1, wherein the wireless device includes a virtual machine and the program includes a script capable of running on the virtual machine.

9. The system of claim 8, wherein the script includes a WMLscript compatible script.

10. The system of claim 8, wherein the script includes a security mechanism requiring user authorization before programming the wireless device number into the programmable memory.

11. The system of claim 10, wherein the security mechanism includes a password.

12. The system of claim 10, wherein the security mechanism includes a biometric passkey.

13. The system of claim 1, further including an interface for communicating with a user client system, wherein a user can select ads for delivery to the wireless device.

14. The system of claim 1, wherein the data record includes storage for data selected from the group consisting of urls, geographic addresses, schedules or directions.

15. The system of claim 1, wherein ads are presented in packages associated with a theme.

PAGE 33/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

16. The system of claim 15, wherein ads are presented in packages selected from the group of themes consisting of tourism, business, new resident, or shopping for specific goods.

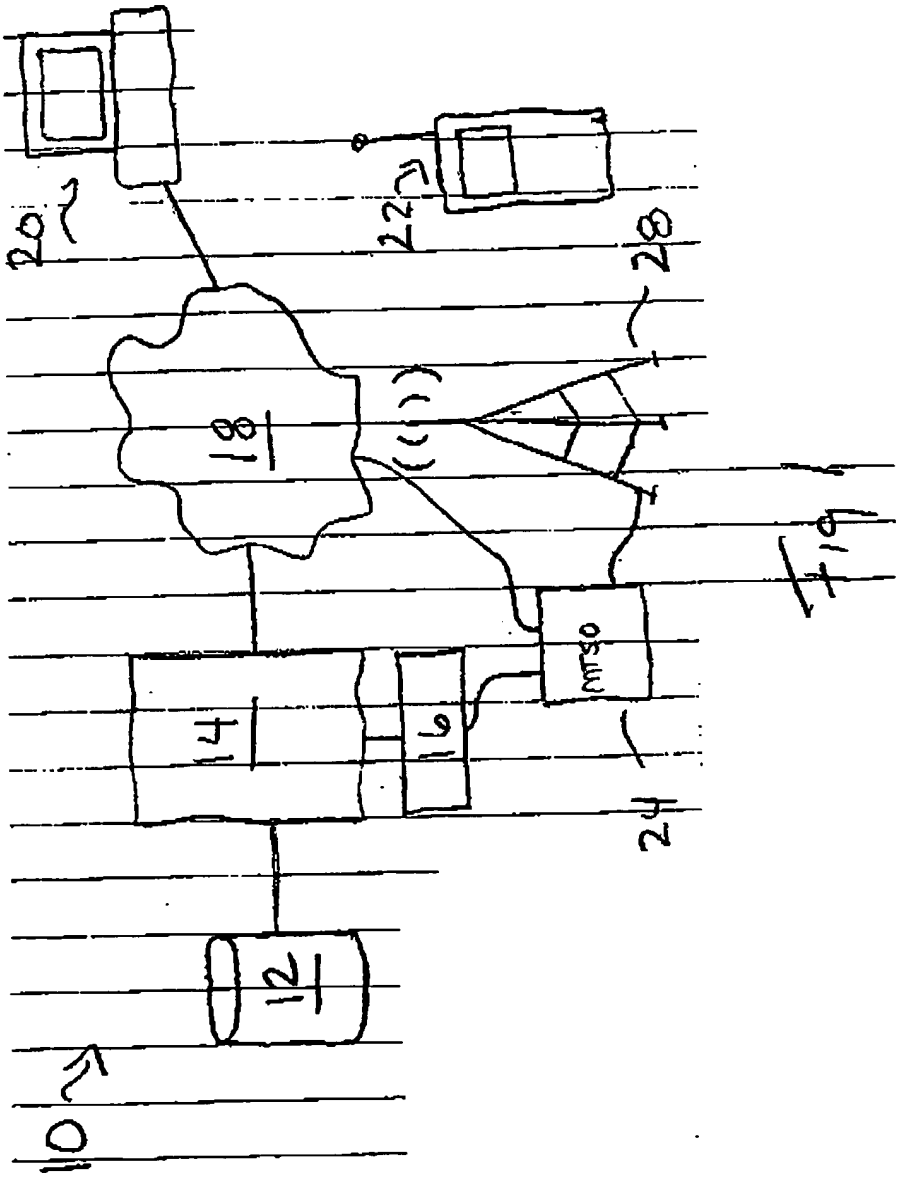
17. A process for allowing advertising over a wireless network, comprising

providing a wireless device having a programmable memory for storing telephone numbers,

providing a web site portal having a database for storing a plurality of data records each data record having storage for a telephone number and each data record being associated with a category of goods or services and having an interface for allowing a company to select one of the categories of good or service and to upload to the data record associated with the selected category a phone number and a data message for storage in the associated data record, and

allowing the programmable wireless device to request data from the web site portal and, in response to the request, selecting at least one of the categories of goods or services, and programming a phone number into the programmable memory of the wireless device for allowing the wireless device to call for the selected category of goods or services.

PAGE 34/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26



PAGE 35/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

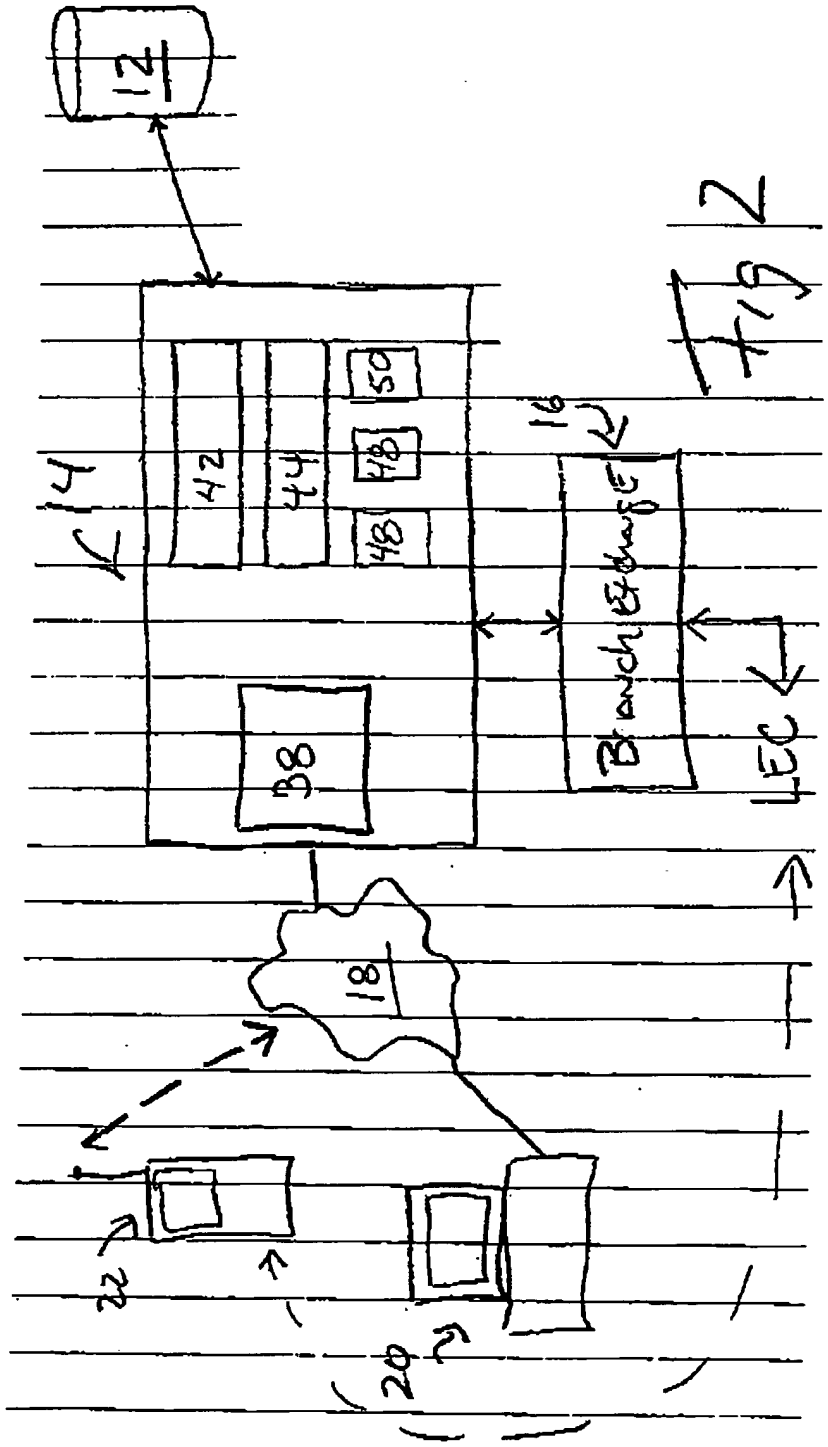


FIG 2

PAGE 36/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

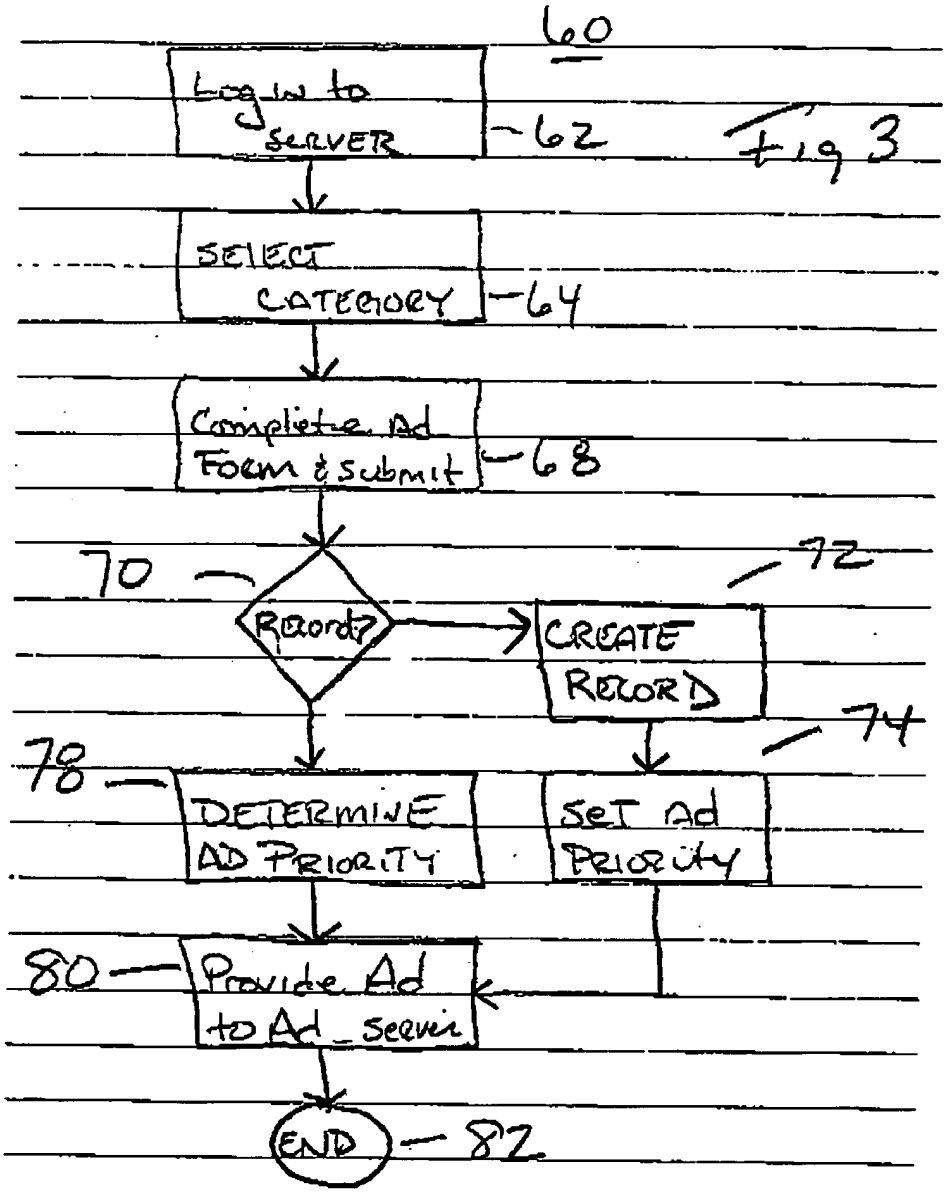


Fig 3

PAGE 37/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

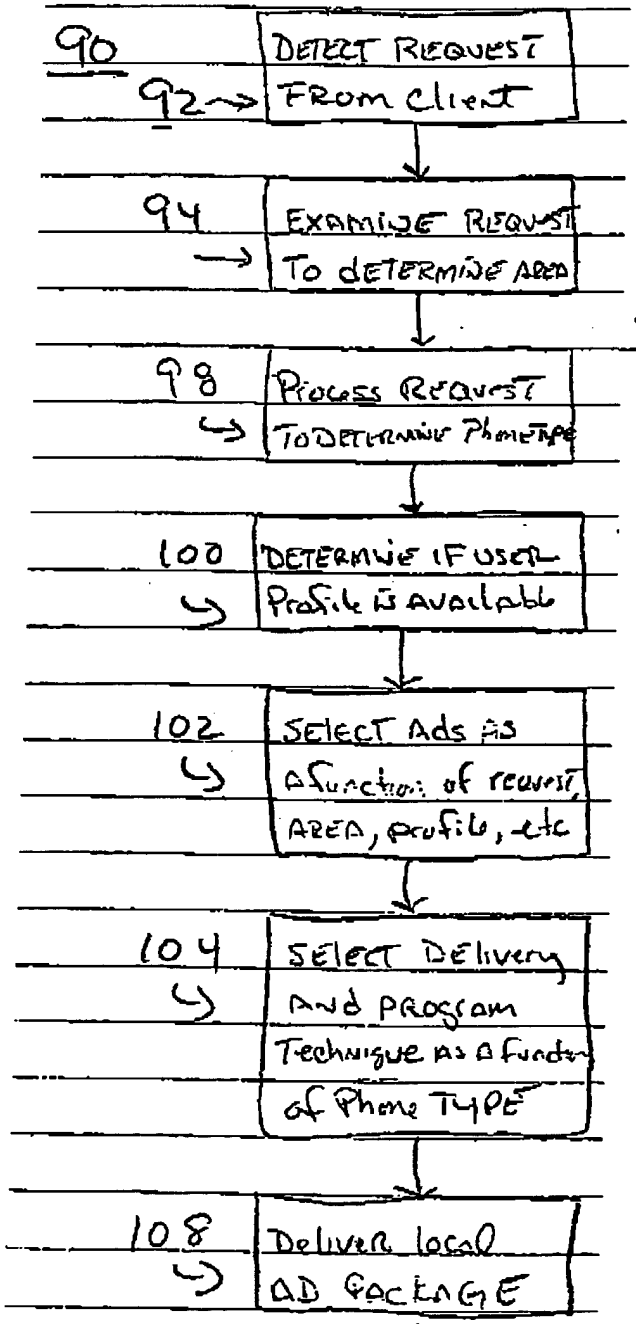
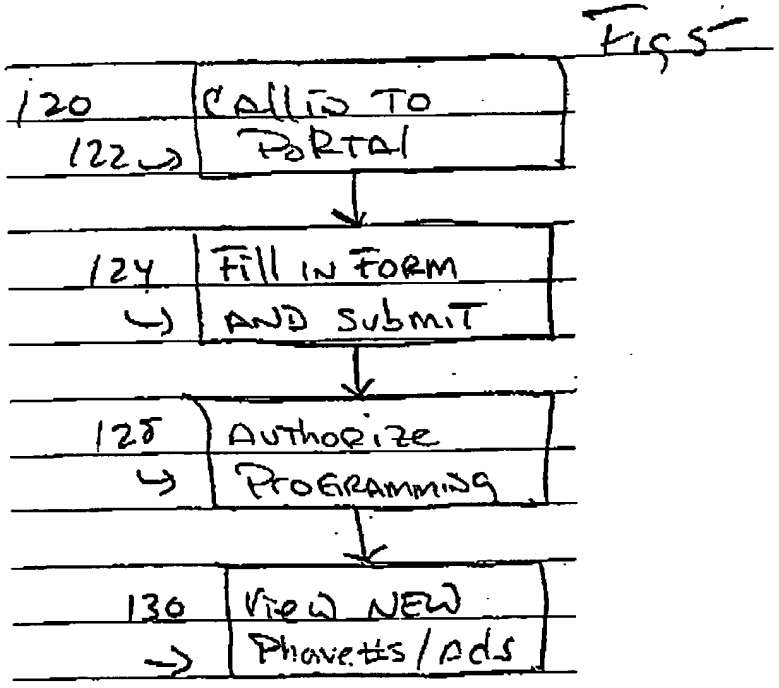


Fig 4

PAGE 38/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26



PAGE 39/39 * RCVD AT 4/7/2006 1:41:30 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/37 * DNIS:2738300 * CSID:6508528063 * DURATION (mm-ss):08-26

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